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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Application of	Atty. Docket No.
CHRISTOPHER B. MARSHALL ET AL.	GB010202
Serial No. 10/046,993	Group Art Unit: 2681
Filed: JANUARY 15, 2002	Examiner

Title: CONNECTIONLESS BROADCAST SIGNALLING

Commissioner for Patents
Washington, D.C. 20231

CLAIM FOR PRIORITY

Sir:

The certified copies of the **GREAT BRITAIN** Application No's. **0101292.1** filed **JANUARY 18, 2001; 0129063.4** filed **DECEMBER 5, 2001** referred to in the Declaration of the above-identified application is attached herewith.

Applicants claim the benefit of the filing date of said **GREAT BRITAIN** applications.

Respectfully submitted,

December 30, 2002
Enclosure

By _____
Dicran Halajian, Reg.39,703
Attorney
(914) 333-9607

CERTIFICATE OF MAILING

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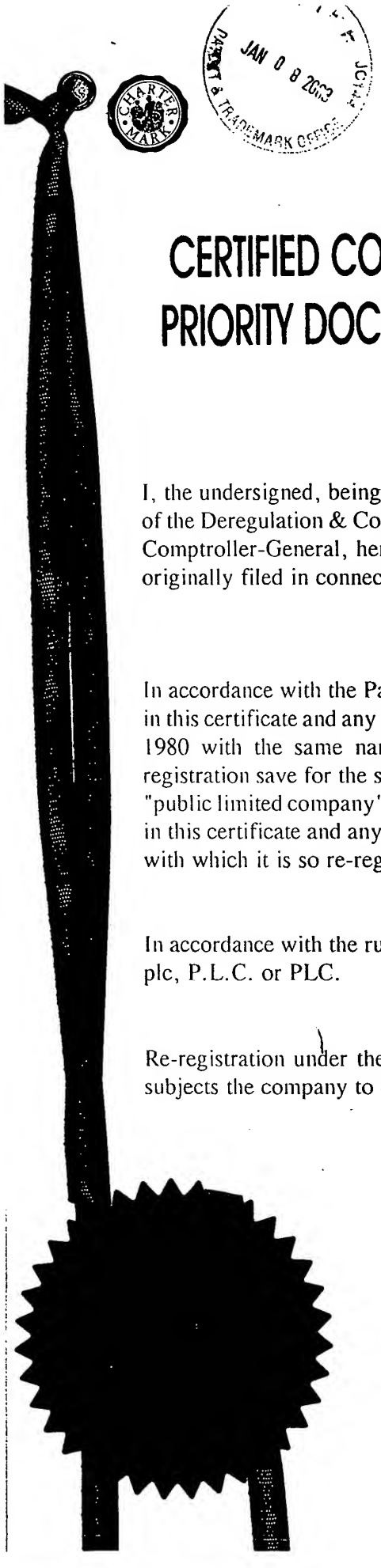

PHGB010202
USA
I - II

INVESTOR IN PEOPLE

The Patent Office
Concept House
Cardiff Road
Newport
South Wales
NP10 8QQ

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18 JAN 2001

1. Your reference — PHGB 010007

18JAN01 E599048-1 D02979
P01/7700 0.00-0101292.1

2. Patent application number *(The Patent Office will fill in this part)* — **0101292.1**

3. Full name, address and postcode of the or of each applicant (*underline all surnames*)

KONINKLIJKE PHILIPS ELECTRONICS N.V.
GROENEWOUDSEWEG 1
5621 BA EINDHOVEN
THE NETHERLANDS

Patents ADP Number (*if you know it*)

If the applicant is a corporate body, give the country/state of its incorporation — THE NETHERLANDS — 7419291001

4. Title of the invention — CONNECTIONLESS BROADCAST SIGNALLING

5. Name of your agent (*if you have one*)
"Address for service" in the United Kingdom to which all correspondence should be sent (*including the postcode*)

ANDREW GORDON WHITE
Philips Corporate Intellectual Property
Cross Oak Lane
Redhill
Surrey
RH1 5HA

Patents ADP number (*if you know it*) — 7133473002

6. If you are declaring priority from one or more earlier patent applications, give the country and the date of filing of the or of each of these earlier applications and (*if you know it*) the or each application number

Country	Priority Application number (*if you know it*)	Date of filing (*day/month/year*)

7. If this application is divided or otherwise derived from an earlier UK application, give the number and the filing date of the earlier application

Number of earlier application	Date of filing (*day/month/year*)

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11. I/We request the grant of a patent on the basis of this application.

Signature [signature] Date 18/1/01

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DESCRIPTION

CONNECTIONLESS BROADCAST SIGNALLING

The present invention relates to mobile communications devices, such as telephones and suitably equipped personal digital assistants (PDA's), and to infrastructure systems and protocols for use with the same.

Recent years have seen a great increase in subscribers world-wide to mobile telephone networks and, through advances in technology and the addition of functionalities, cellular telephones have become personal, trusted devices. A result of this is that a mobile information society is developing, with personalised and localised services becoming increasingly more important. Such "Context-Aware" (CA) mobile telephones are used with low power, short range base stations in places like shopping malls to provide location-specific information. This information might include local maps, information on nearby shops and restaurants and so on. The user's CA terminal may be equipped to filter the information received according to pre-stored user preferences and the user is only alerted if an item of data of particular interest has been received.

Commonly-assigned United Kingdom patent application 0020099.8 filed 15th August 2000, describes a CA terminal and puts forward the concept of broadcasting data before a connection is made according to Bluetooth protocols. It exploits the Bluetooth Inquiry phase by extending the very short ID packet sent out during this mode and using the extra space thus gained to carry a small amount of information. This information can be Bluetooth system related data or one-way application data. This scheme has the potentially useful feature of being backwards-compatible with legacy Bluetooth devices that are not able to understand this extra field.

Several applications can exploit this feature. Wireless local-area network (WLAN) access is one example; another is given in commonly assigned United Kingdom patent application 0020073.3 filed 15th August 2000.

To help two Bluetooth transceivers find each other, the Inquiry procedure is restricted to a specially chosen set of 32 channels from the 79 available and to a special hopping sequence inherently known by all Bluetooth transceivers. Since the broadcast data field is attached to the ID packets, it follows the same pattern. This raises a potential conflict with the FCC regulations concerning the 2.4 GHz ISM band, which broadly state that information transfer must be spread over the entire ISM band.

There are two principle classes of spread spectrum radio system, which occupy a wide bandwidth compared to the data rate to be communicated, in order to statistically smear out interference to other band users. Frequency Hopping radio systems are known, and Direct Sequence systems are known. Systems are also known that are a hybrid of the two, with direct sequence spreading of a data stream, the carrier hopping periodically from one frequency to another. These are all specifically allowed for in the FCC regulations for the ISM band at 2.4GHz.

It will be recognised that an important requirement for CA devices is that they quickly and efficiently gather data from beacons (or other transmitting sources of data) such that the user is not required to undertake actions such as staying close to a beacon whilst contact is established between portable device and beacon, nor having to specifically initiate interaction.

It is therefore an object of the present invention to establish a means for wireless connectivity for communications devices which does not contravene existing regulations.

In accordance with the present invention there is provided a communications system comprising at least two devices capable of wirelessly exchanging data according to a first mode of operation, at least one of said devices further wirelessly broadcasting data according to a second mode of operation, and at least a third device being configured to receive said data broadcast according to said second mode of operation. Said third device is suitably configured to commence wirelessly exchanging data with at least one of said first and second devices according to said first mode of operation

having received predetermined data broadcast according to said second mode of operation.

In a preferred embodiment, the invention takes the form of a radio system containing two modes of operation, one – for communication within network members – using frequency hopping, and the other – for sharing data with non-members or devices wishing to join the network – transmitting data using direct sequence spread spectrum.

Further features and advantages of the present invention will become apparent from reading of the following description of preferred embodiments of the present invention, given by way of example only, and with reference to the accompanying drawing, Figure 1, which is a schematic representation of networked and non-networked communications devices.

Referring to Figure 1, a communications system comprises at least two devices (10, 12) capable of networking by wirelessly exchanging data according to a first mode of operation (FH), such as frequency hopping. At least one of these devices (12) further wirelessly broadcasts data according to a second mode of operation (DSSS), using for example a direct sequence spread spectrum. A third device (14), configured to receive the said data broadcast, may then acquire data without having to join the network of the other devices, or as a precursor to joining such network.

The reason for the applicants selection of DSSS is that it removes the requirement (under the regulations, and for system robustness) for a long hop sequence, and therefore allows faster finding of the signal by an unsynchronised receiver. This reduces the latency required to be able to receive messages.

Where message transmission according to Bluetooth protocols is supported, the Bluetooth system takes advantage of this for sending fixed messages, which can be argued in themselves to represent spreading sequences.

A new step is to send data information over the channel in this DSSS mode, by spreading it with a sequence. This provides a means of broadcasting information to non-members or devices wishing to join the network without them having to go through a time-consuming process of searching for a long hop sequence.

The DSSS mode may be a single channel, allocated specifically for this purpose, or a limited number of channels, over which the transmitter hops. This latter provides some robustness against interference, though without the excessive synchronisation implications of a full hopping system.

The two modes of operation may take place in an interlaced manner, using the same radio operating in pure frequency hopping or using DSSS for different data communication tasks. The gross bearer data rate over the air can be maintained at the same rate for both modes, simplifying radio design, if the net data rate is reduced by an amount corresponding to the spreading code imposed. Though this reduces the data rate that can be supported, it does also improve robustness to noise and interference.

Alternatively the two functions of the system, the provision of broadcast and/or acquisition information and traffic-carrying can be implemented in different radios using the corresponding different modes (DSSS and pure frequency hopping), with the information to be communicated by each co-ordinated accordingly.

For our typical embodiment, there are two illustrative outline realisations. In the first, a modification to the Bluetooth enquiry mode, data to be sent (at (1Mb/s / 11) = 91kb/s is appended to the enquiry message after first being passed through an exclusive or with an 11 bit Barker code sequence running at 1Mb/s. This performs the required spreading of the raw data to form a bearer data rate of 1Mb/s. In the receiver the 1Mb/s data stream is recovered in the normal way, and the data appended at the end of the enquiry message is passed through a corresponding 11-bit sequence to recover the original 91kb/s broadcast data stream.

In the second approach, a synergetic combination of two systems, a frequency hopping system (such as Bluetooth) is combined with a single

channel DSSS system (such as "Lite"). Broadcast and registration/synchronisation information are communicated over the Lite system, and traffic channels are set up using the Bluetooth system as desired. The two systems can be served by a single device if desired, by periodically switching between modes of operation.

In the foregoing, we have described a method and apparatus applicable to general short range communication, but in particular to beacons for Context Aware applications, and improvements to the Bluetooth system and applications including Local Positioning and Wireless LAN access.

From reading the present disclosure, other modifications will be apparent to persons skilled in the art. Such modifications may involve other features which are already known in the design, manufacture and use of fixed and portable communications systems, and systems and components for incorporation therein and which may be used instead of or in addition to features already described herein.

CLAIMS:

1. A communications system comprising at least two devices capable of wirelessly exchanging data according to a first mode of operation, at least one of said devices further wirelessly broadcasting data according to a second mode of operation, and at least a third device being configured to receive said data broadcast according to said second mode of operation.

2. A system as claimed in Claim 1, wherein said third device is configured to commence wirelessly exchanging data with at least one of said first and second devices according to said first mode of operation having received predetermined data broadcast according to said second mode of operation.

3. A communications system substantially as hereinbefore described and claimed.

4. A portable communications device configured for use in a communications system substantially as hereinbefore described and claimed.

ABSTRACT

CONNECTIONLESS BROADCAST SIGNALLING

A communications system comprising at least two devices (10, 12) capable of networking by wirelessly exchanging data according to a first mode of operation (FH), such as frequency hopping. At least one of these devices (12) further wirelessly broadcasts data according to a second mode of operation (DSSS), using for example a direct sequence spread spectrum. A third device (14), configured to receive the said data broadcast, may then acquire data without having to join the network of the other devices, or as a precursor to joining such network.

(Figure 1)

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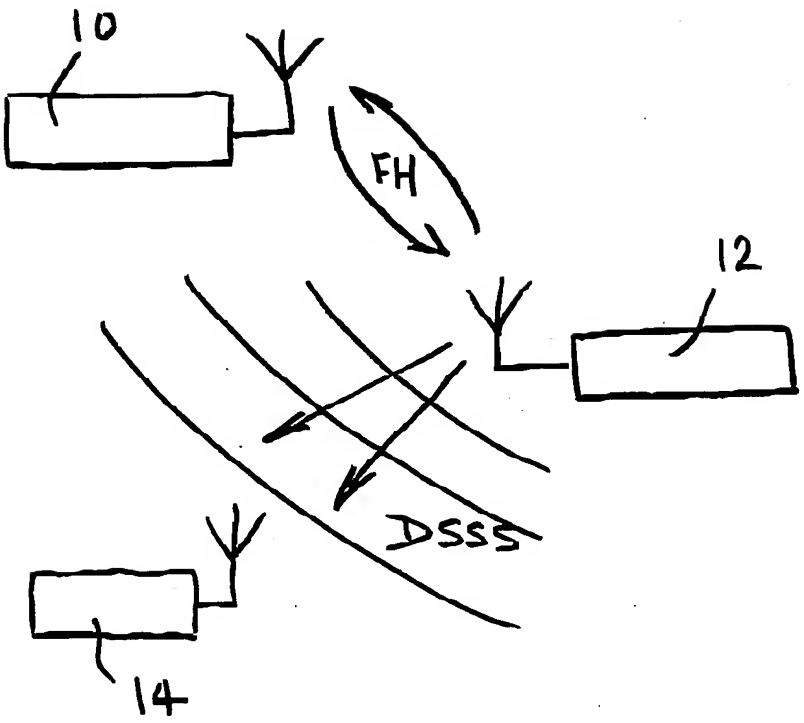

FIG. 1

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